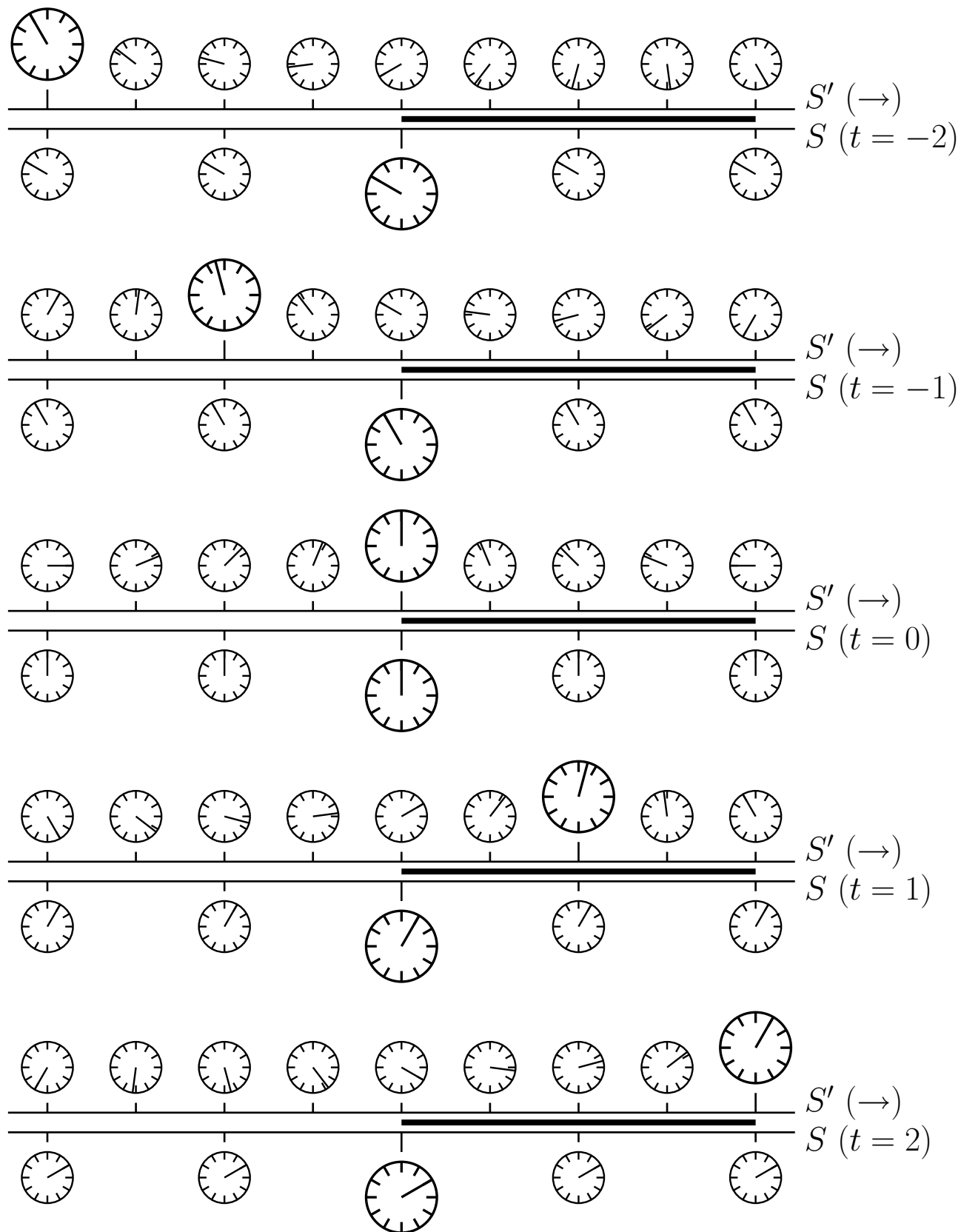Situation as viewed by S ($\gamma = 2$).

Situation as viewed by S' ($\gamma = 2$).

S' ($t' = -2$)
S ($\leftarrow$)

S' ($t' = -1$)
S ($\leftarrow$)

S' ($t' = 0$)
S ($\leftarrow$)

S' ($t' = 1$)
S ($\leftarrow$)

S' ($t' = 2$)
S ($\leftarrow$)